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# THE AMERICAN MIDLAND NATURALIST

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# THE AMERICAN MIDLAND NATURALIST

Devoted to Natural History, Primarily
that of the Prairie States

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J. A. NIEUWLAND, C. S. C., Ph. D., Sc. D., Editor

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# University of Notre Dame

## Series of Botanical Slides

* * *

THE following list of microscopic mounts comprises mostly preparations in the Venetian turpentine method or in glycerine jelly. Care must be taken not to expose the Venetian turpentine mounts to direct sunlight when the stain is Magdala Red, as they will fade. Diffuse daylight seems to have no bad results. If the mount is overstained, judicious exposure to sunlight will reduce it as desired Hence Magdala red mounts are usually overstained. Examination of the list will reveal the fact that many of the following slides have not been put on the market by supply companies in this country.

The following are particularly interesting as types or on account of their rarity. They have been especially selected to illustrate the forms usually described in text books of botany and are offered at a price lower than can be elsewhere obtained. They may be had both in Venetian turpentine or in glycerine jelly. I call special attention to the following as illustrating beautifully the evolution of sex differentiation in the lower plants.

A —Ulothrix, no sexual process. Zoospore formation.

B—Pleurocarpus mirabilis, Lateral Conjugation. (Same as 39)

C—Mougeotia scalaris (Mesocarpus) Conjugation. (Same as 32)

D—Spirogyra with lateral conjugation. (Same as 45)

E—Mucor, (bread mould), in all stages of conjugation.

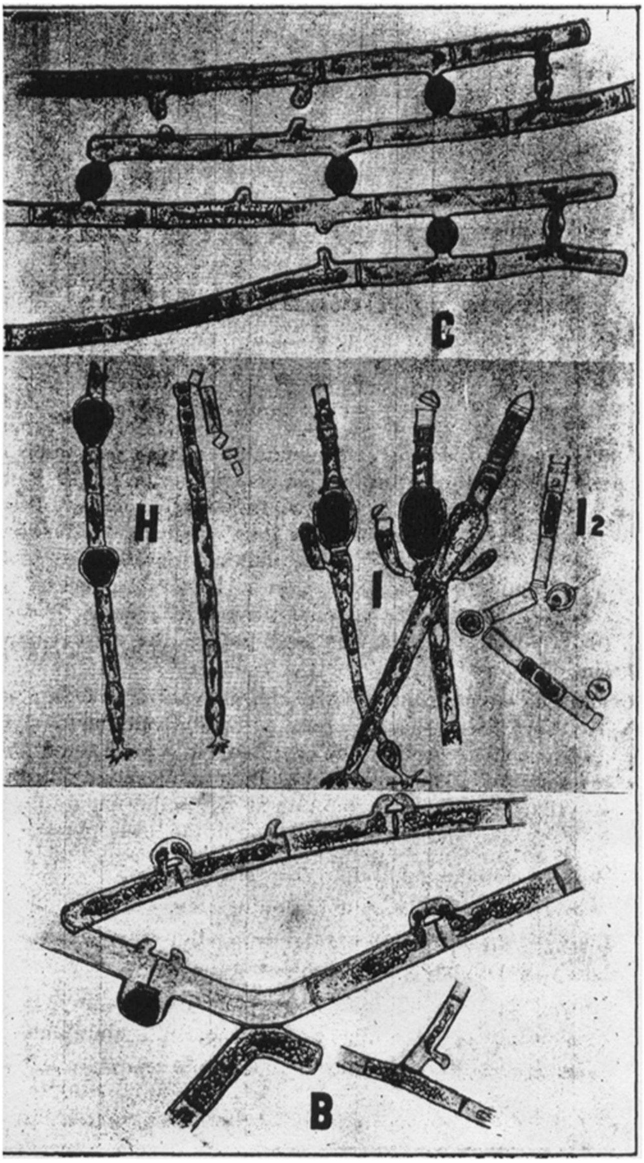
F—Zygnema, Spirogyra, conjugation all stages. (Separate slides)

G—Vaucheria sessilis, or geminata, all stages of reproduction. (Separate slides)

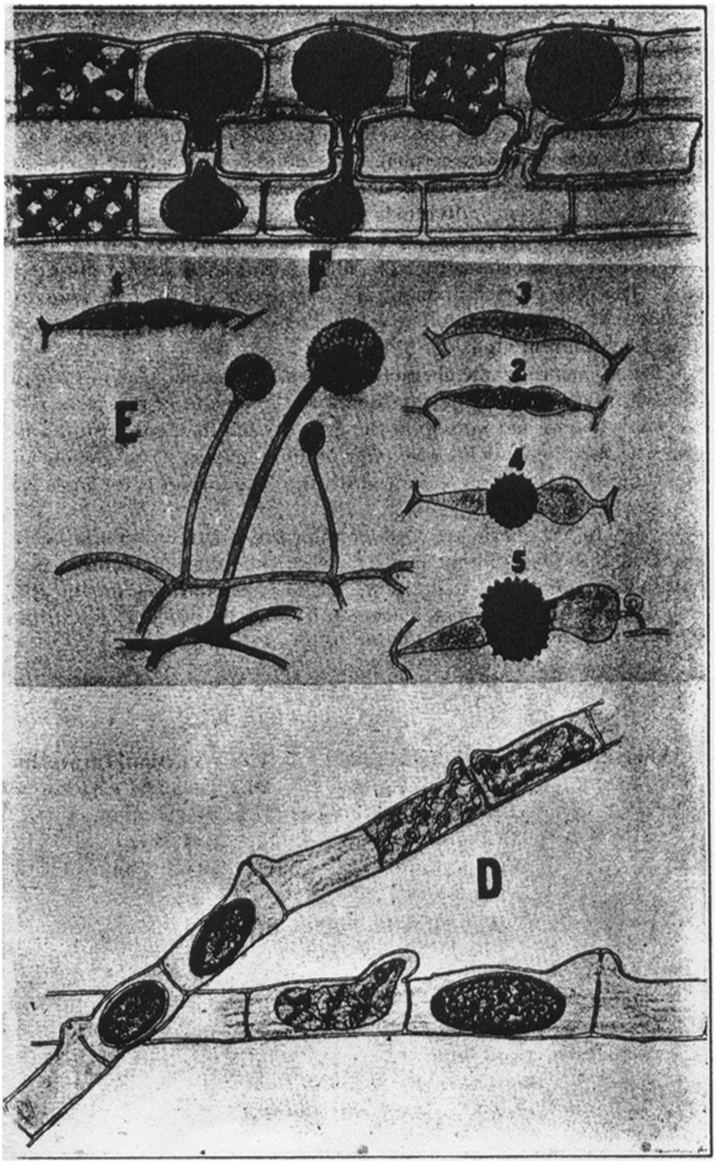
H—Oedogonium, (ordinary form)[1] "holdfasts,"[2] Zoospores,[3] Antheridia and ooginia. (Separate slides.)

I—Oedogonium with "holdfasts," oospheres, antherozoids, androspores, and "dwarf males." (One slide.)

K—Desmids, vegetative and conjugating (5 Species). (As listed and priced below.) 3 slides.



B—Pleurocarpus. Mirbailis. Various stages of lateral conjugation.
C—Mougeotia scalaris (Mesocarpus scalaris). Various stages of conjugation.
H—Oedogonium. Antheridia and Oogonia, and "Holdfasts."
I— " (nanandrous) Oogona, Antheridia, "Dwarf Males" and holdfasts
I— " Assexual reproduction, Zoospores.



D—Spirogyra Hassallii. Lateral Conjugation.
E—Mucor and Sporangia. All stages of Conjugation.
F—Spirogyra Nitida. Various stages of Conjugation.

## Description of Illustrations

B — In Pleurocarpus, conjugation takes place on the partition cell wall of adjacent cells in one filament. The sexes of the filaments neither as individuals nor as separate cells of a filament can be distinguished as the zygospore is formed midway between the cells on the edge of the partition.

C — In Mougeotia, (Mesocarpus). The neighboring cells of each filament are of one sex and hence each filament is unisexual; for conjugation takes place between different individuals. The sex of filaments however can not be distinguished as the zygospore is found equidistant between the filaments.

D — In Spirogyra (Hassallii). The filaments as such are not differentiated in sex. The cells of each filament are alternately of different sexes and as the gamete of one passes into the cell of the other gamete, the sexes of the cells can be differentiated.

E — Mucor has the same characteristics as Mougeotia. One of the gametes is usually larger and may be considered as the female or receptive zell.

F — In Zygnema and Spirogyra the cells of each filament are uniformly of of one sex, the filaments are regularly of different sex. The gamete of one enters the cell of the other to unite with it. The former is the male gamete the latter the female.

G, H, I — In Vaucheria and Oedogonium sex differentiation is complete. The sexual cells are different in size, shape. and other characteristics. The variation is greater in *g* than in *h*, *i*. The nanandrous modification of Oedogonium exhibits a greater complexity in the process of fertilization, due to the presence of "dwarf males."

---

Abbreviations —

| | | | |
|---|---|---|---|
| MR. | Magdala red. | VT. | Venetian, turpentine. |
| IG. | Iodine green. | DH. | Delafield's haematoxylin |
| BB. | Bismarck brown. | HA. | Haem alum. |
| IA. | Iron alum. | S. | Saffranin. |
| C. | Cyanin. | E. | Erythrosin. |

### ALGAE AND FUNGI SERIES

BLUE ALGAE —

1 — Anabaena, (Unstained — Contains Coleosphaerium).
2 — Nostoc, VT., MR.
3 — Oscillatoria, small form.
4 — " large form, *a* — MR., VT.
*b* — Unstained in glycerine.
5 — Spirulina. Spiral or kinky form like Oscillatoria.
6 — Tolypothrix, *a* — VT., MR. (False Branching)
*b* — Unstained.
7 — Rivularia, VT., MR.
8 — Lyngbya. Large form with sheaths.

GREEN, RED AND BROWN ALGAE—

9 — Ankistrodesmus falcatus.
10 — Bactrachospermum, fresh water red alga, MR , VT.
11 — Chara, archegonia and antheridia, MR., VT. Mounted whole.
* 12 — Coleochaete pulvinata, Coleochaete scutata, oogonia and trichogyne, MR., VT. (50)
* 13 — Bulbochaete, oogonia, antheridia. Early stage. Unstained. (25)
* 14 — Bulbochaete, oogonia, antheridia, dwarf males with androspores, later stage, glycerine unstained. Both very rare. (25)
15 — Chaetophora, DH.
16 — Cladophora, MR., VT.
17 — Vegetative Conferva, (Tribonema.) MR., VT.
18 — Closterium, vegetative, In state of division, *a*— Unstained, glycerine.
*b* — MR., VT.
* 19 — Desmids, Closterium. When specially called for. Very rare. Advanced stages of conjugation. (50)
* 20 — Desmids, Cosmarium botrytis, conjugating. Also Penium. (25)
Rare, MR. VT.
* *a*—Sections of same from paraffine, of zygotes. DH., MR. (50)
21 — " Staurastrum rugulosum and Cosmarium tumidum (Latter with assexual auxospores), zygospores, very numerous.
*a* — Unstained, glycerine. Quite rare.
*b* — MR., VT.
22 — Diatoms or Frustules balsam mounts ( Auxospore of Melosira varians) MR., VT.
23 — Draparnaldia glomerata, *a* — Glycerine.
*b* — MR., VT.
24 — Dasya elegans, cystocarps, MR., VT.
25 — Euglena viridis, *a* — Unstained.
*b* — MR., VT.
26 — Ectocarpus, sporangia, multilocular and unilocular. MR., VT.
* 27 — Fucus vesiculosus, *a*— Oogonia. Parrafine sections of the conceptacle (25)
* 28 — *b* — Antheridia. (stained. (25)
29 — Haematococcus pluvialis, *a* — Unstained. (Better than b)
*b* — MR., VT.
30 — Hydrodictyon, large and small. *a* — Glycerine, Eosin.
*b* — MR., VT
* 31 — Laminaria, sections C or S. (25)
* 31 a — Lemanea torulosa. Fresh water, Brown algae. Section of fruiting thallus. (25)
32 — Mesocarpus scalaris, *a* — DH. or HA. (Better mount.)
(Very rare.) *b* — MR., VT. (See illustration C.)
32 a — Myxonema tenue. Unstained.
33 — Nemalion, Marine red alga, MR., VT.
34 — Oedogonium, oogonia and antheridia.
*a* — DH. or unstained. (See illustration H)
*b* — MR., VT.

35 — " germinating, with "holdfasts." *a* — Unstained. (better)
*b* — MR., VT.

36 — " (Rare form) holdfasts, oogonia, antheridia, androspores, and dwarf male plants. *a* — Unstained. (See illustration I)
*b* — MR., VT.
*c* — C., S.

37 — Oedogonium, zoospores escaping. Unstained. (Not common.)
(See Illustration I)

38 — Pediastrum boryanum. Mixed with Closterium and diatoms. MR., VT. (Hard to obtain.)

39 — Pleurocarpus mirabillis, conjugation and zygospores. Zygospores between filaments. (Rare) *a* — DH. (See illustration B)
*b* — MR. VT. (not as good as a.)

40 — Polysyphonia, tetraspores, cystocarps. MR., VT. Separate slides.
41 — Scenedesmus, *a* — Unstained.
*b* — MR., VT.

42 — Spirogyra nitida, zygospore formation, unstained, *a* — Early stage.
43 — " " " " " *b* — Later stage.
44 — " various of stains DH. as ordered *a* — Light stain
(See illustration F) *b* — Medium stain (best)
*c* — Dark stain

45 — Spyrogyra Hassalii conjugation between adjacent cells of one filament over cell wall. *a* — DH. (Best.) (See illustration D)
*b* — MR., VT.
(Rare.) *c* — MR., DH., VT.

46 — Spirogyra, IG. and MR., VT.
47 — " MR., VT.
48 — " BB.
49 — " DH., MR , VT.
} Show particular parts of nuclei and chromatophore
50 — Tetraspora, *a* — Unstained.

51 — Ulothrix zonata, *a* — Unstained.
*b* — DH.
*c* — MR. (c and f are the best.)
*d* — MR., IG., VT.
*e* — MR., DH., VT.
*f* — MR., AB.

52 — Vaucheria geminata, *a* — Unstained.
*b* — Eosin, glycerine.
*c* — MR., VT.
52 *I* — " hamata, unstained.

53 — Vaucheria sessilis, *a* — Unstained
*b* — Eosin, glycerine.
*c* — MR., VT.
} As a type the following is better. No. 53 I.
53 *I* — " sericea oogonia, and autheridia. Unstained

54 — Vaucheria sessilis, *a* — Sprouting zoospores.
*b* — " " small form

55 — Volvox globator, MR., VT. or IG.

56 Zygnema leiospermum, veg. and conjug., early and late stages,
$a^1$—DH., VT.
$a^2$—DH., Glyc.
*b*—MR., VT.
$a^2$, e, and f are the best types *c*—BB., VT.
*d*—MR., DH., VT.
*e*—IA. show nuclei.
*f*—MR., AB.

FUNGI—

* 59—Agaricus or Coprinus, sections from parrafine. DH., C., S., Etc. (25)
* 60—Clavaria, Sections, C., DH., S. (25)
* 61—Aecidia and aecidiospores on Commandra umbellata. Sections, DH., C., S. (25)
* 61—a—Aecidia and aecidiospores on Arisaema triphyllum. (25)
* 62— " " " " Barberry. " " " (25)
* 63— " " " and Pycnidia, barberry. Sections DH. C. S. (25)
63 a— " on various other plants, such as Sambucus (elder), Euphorbia etc.
* 64—Teleutospores, on Wheat. (25)
* 65—Uredospores. " " (25)
* 66—Lycoperdon. (Puff Ball) Sections DH., S. (25)
67—Mucor, bread mould, Sporangia and ZYGOSPORES in all stages of development. (Very rare) *a*—Unstained.
*b*—MR., AB.
*c*—MR. VT. (best) Also balsam mount
* 68—Ustilago, smut on Isopyrum biternatum sections of affected stem from paraffine, DH. S. (25)
* 69—Ascomycetes, variously stained, several species can be supplied. (25)
71—Pennicilium, vegetative on various other plants esp. Oedogonium
75—Myxomycetes. Nearly 100 species. Mostly unstained mounts of the spores, sporangia, capillitium, peridium of the mountable forms. i. e. Stemonites, Dictydiums, Trichias, Hemitrichias Ceratiomyxa, Physareae, Crateriums, Lycogala, Arcyrias, Fuligo, Cribrarias, Hemiarcyriae, Didymiums, Perichaena, Diacheaė Didermas, Comatrichas, etc. All mounted in Balsam.
76—Prothallium, mounted whole. MR. VT.

Slides illustrative of the other plant groups can be supplied when specially called for. Slides are also made to order when the number ordered warrants the trouble.

Among the slides that can be supplied within short notice are the following. All sections from paraffine embeddings.

BRYOPHYTA—

* 80—Antheridia of moss. (25)
* 81—Archegonia of Marchantia. (25)
* 82—Gemmae and cupule of Liverwort. Marchantia or Ricciocarpus. (25)
* 83—Air chambers of Liverwort. Marchantia or Ricciocarpus. (25)
* 84—Sporophyte of " " " (25)

| | | |
|---|---|---|
| * 85 | Stem cross section of moss. Polytrichum commune with leaf arrangement. | (25) |
| * 86 | Anthoceros | (25) |

PTERIDOPHYTA—

| | | |
|---|---|---|
| * 90 | Leaf and sporangia development of Fern. Pteris cristata. | (25) |
| * 91 | Section of Petiole, cross or longitudinal. " " | (25) |
| * 92 | Stem tip of Equisetum, showing apical growth and leaf development. | (25) |
| * 93 | Strobilus of Equisetum hiemale. | (25) |
| * 94 | Section of stem of Same. | (25) |
| * 95 | Section of Stem of Lycopodium. | (25) |
| * 96 | Section of Strobilus of Lycopodium. | (25) |
| * 97 | Azolla (also Isoetes.) | (25) |

SPERMAPHYTA—

| | | |
|---|---|---|
| *100 | Leaf of Pine with Stomata (centric Leaf Type.) | (25) |
| *101 | Bicolateral leaf type, Lilac or Barberry. | (25) |
| *102 | Root Type. Melilotus alba. | (25) |
| *103 | Pine stem. | (25) |
| *104 | Dicotyledon type. | (25) |
| *105 | Monocotyledon type. Corn or Smilax. | (25) |
| *106 | Parasite with degenerate wood bundle. Dodder. | (25) |
| *107 | Dodder on host, Impatiens fulva. | (25) |
| *108 | Water plant type. Potamogeton. | (25) |
| *109 | Embryo, Bursa pastoris. | (25) |
| *110 | Root tip. Tradescantia Virginica. Mitosis of nucleus. | (25) |
| *111 | Floral development of several species. Compositae | (25) |
| *112 | Nitrifying bacteria in tubercles of clover. Trifolium or Melilotus | (25) |
| *113 | Sections of leaf arrangement (estivation) | (25) |
| *114 | Degenerate Phanerogam. Frond of Flowering Lemna minor. Mounted whole. | (25) |

Etc., Etc., Etc., Etc.

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Price 20 cents net unless otherwise marked.
30 Slides for 5 dollars.
75 " " 10 "
Orders over 10 " with many duplicates can in some cases get special rates.

N.B.—Material illustrated in these slides may be supplied and in special cases alive or fixed, for histological purposes, or simply for habit study rates 50c to [illegible]ial. Algae can at times be supplied alive and out of season, owing [illegible] facilities in growing these forms.

**The Director of the Botanical Laboratory,**
**The University of Notre Dame,**
**Notre Dame, Indiana.**

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